

WHAT IS CLAIMED IS:

1. An intracellular-reaction measuring
apparatus for measuring intracellular reactions by
the use of a specimen in which a plurality of cell
5 colonies are contained in a non-contact state; the
apparatus comprising:

specifying means in which the intensity of first
light emitted from the specimen in accordance with
the presence of a stated protein is detected to
10 specify, of the plurality of cell colonies, a noted
colony containing cells where the stated protein is
present; and

selection means in which the intensity of second
light emitted from the specimen in accordance with
15 the intracellular reactions is detected to select, of
the detected intensity of the second light, the
intensity of the second light emitted from the noted
colony.

20 2. The intracellular-reaction measuring
apparatus according to claim 1, which further
comprises a chemical-substance introduction device
for introducing into said cells chemical substances
which target said protein.

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3. The intracellular-reaction measuring
apparatus according to claim 1, wherein;

said apparatus further comprises:

calculation means for calculating the proportion
of cells where said protein is present, in regard to
respective noted colonies specified by said
5 specifying means; and

sorting means for sorting, of the noted colonies
specified by said specifying means, a noted colony
where said proportion is higher than a stated
standard proportion; and

10 said selection means detecting the intensity of
said second light to select, of the detected
intensity of said second light, the intensity of said
second light emitted from the noted colony sorted out
by said sorting means.

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4. The intracellular-reaction measuring
apparatus according to claim 1, wherein;

said selection means detects the intensity of
said second light at intervals of a constant time to
20 select, of the detected intensity of said second
light, the intensity of said second light emitted
from said noted colony.

5. The intracellular-reaction measuring
25 apparatus according to claim 2, wherein;

said specifying means detects as the intensity
of said first light the intensity of first light

emitted from a fluorescent protein expressed together with said protein, to specify said noted colony; and

said selection means detects the intensity of second light emitted from a fluorescent probe for measuring intracellular reactions, introduced into said specimen, to select, of the detected intensity of said second light, the intensity of said second light emitted from said noted colony, as the intensity of said second light.

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6. The intracellular-reaction measuring apparatus according to claim 2, wherein;

said apparatus further comprises:

calculation means for calculating the proportion of cells where said protein is present, in regard to respective noted colonies specified by said specifying means; and

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sorting means for sorting out, of the noted colonies specified by said specifying means, a noted colony where said proportion is higher than a stated standard proportion; and

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said selection means detecting the intensity of said second light to select, of the detected intensity of said second light, the intensity of said second light emitted from the noted colony sorted out by said sorting means.

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7. The intracellular-reaction measuring apparatus according to claim 2, wherein;

said apparatus further comprises:

5 detection means for detecting the timing at which said chemical substances are introduced into said specimen; and

said selection means detecting the intensity of said second light at least twice, before said chemical substances are introduced and after a
10 certain time after said chemical substances have been introduced, to select, of the detected intensity of said second light, the intensity of said second light emitted from said noted colony.

15 8. The intracellular-reaction measuring apparatus according to claim 5, wherein;

said apparatus further comprises:

calculation means for calculating the proportion of cells where said protein is present, in regard to
20 respective noted colonies specified by said specifying means; and

sorting means for sorting out, of the noted colonies specified by said specifying means, a noted colony where said proportion is higher than a stated
25 standard proportion; and

said selection means detecting the intensity of said second light to select, of the detected

intensity of said second light, the intensity of said second light emitted from the noted colony sorted out by said sorting means.

5 9. The intracellular-reaction measuring apparatus according to claim 8, wherein;

 said calculation means further calculates the number of all cells in regard to respective noted colonies specified by said specifying means; and

10 said sorting means sorts out, of the noted colonies specified by said specifying means, a noted colony where said proportion is higher than a stated standard proportion and the number of all said cells is smaller than a stated standard number.

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 10. The intracellular-reaction measuring apparatus according to claim 9, wherein;

 said apparatus further comprises:

 detection means for detecting the timing at
20 which said chemical substances are introduced into said specimen; and

 said selection means detecting the intensity of said second light at least twice, before said chemical substances are introduced and after a
25 certain time after said chemical substances have been introduced, to select, of the detected intensity of said second light, the intensity of said second light

emitted from said noted colony.

11. An intracellular-reaction measuring apparatus for measuring intracellular reactions by the use of a specimen in which a plurality of cells stand adherent to one another; the apparatus comprising:

specifying means in which the intensity of first light emitted from the specimen in accordance with the presence of a stated protein is detected to specify a noted region having cells where the stated protein is present, in a higher proportion than a stated standard proportion; and

selection means in which the intensity of second light emitted from the specimen in accordance with intracellular reactions induced by the protein is detected to select, of the detected intensity of the second light, the intensity of the second light emitted from the noted region.

12. The intracellular-reaction measuring apparatus according to claim 11, which further comprises a chemical-substance introduction means for introducing into said cells chemical substances which target said protein.

13. The intracellular-reaction measuring

apparatus according to claim 11, wherein;

said selection means detects the intensity of
said second light at intervals of a constant time to
select, of the detected intensity of said second
5 light, the intensity of said second light emitted
from said noted region.

14. The intracellular-reaction measuring
apparatus according to claim 12, wherein;

10 said specifying means detects as the intensity
of said first light the intensity of first light
emitted from a fluorescent protein expressed together
with said protein, to specify said noted region; and
said selection means detects the intensity of
15 second light emitted from a fluorescent probe for
measuring intracellular reactions, introduced into
said specimen, to select, of the detected intensity
of said second light, the intensity of said second
light emitted from said noted region, as the
20 intensity of said second light.

15. The intracellular-reaction measuring
apparatus according to claim 12, wherein;

said apparatus further comprises:
25 detection means for detecting the timing at
which said chemical substances are introduced into
said specimen; and

said selection means detects the intensity of
said second light at least twice, before said
chemical substances are introduced and after a
certain time after said chemical substances have been
5 introduced, to select, of the detected intensity of
said second light, the intensity of said second light
emitted from said noted region.

16. An intracellular-reaction measuring
10 apparatus for measuring intracellular reactions by
the use of a specimen in which a plurality of cells
are contained; the apparatus comprising:

specifying means in which the intensity of first
light emitted from the specimen in accordance with
15 the presence of a stated protein is detected to
specify, of the plurality of cells, a noted cell
where the stated protein is present; and

selection means in which the intensity of second
light emitted from the specimen in accordance with
20 intracellular reactions induced by the protein is
detected to select, of the detected intensity of the
second light, the intensity of the second light
emitted from the noted cell.

25 17. The intracellular-reaction measuring
apparatus according to claim 16, which further
comprises a chemical-substance introduction means for

introducing into said cells chemical substances which target said protein.

18. The intracellular-reaction measuring
5 apparatus according to claim 16, wherein;

said selection means detects the intensity of
said second light at intervals of a constant time to
select, of the detected intensity of said second
light, the intensity of said second light emitted
10 from said noted cell.

19. The intracellular-reaction measuring
apparatus according to claim 17, wherein;

said specifying means detects as the intensity
15 of said first light the intensity of first light
emitted from a fluorescent protein expressed together
with said protein, to specify said noted cell; and

said selection means detects the intensity of
second light emitted from a fluorescent probe for
20 measuring intracellular reactions, introduced into
said specimen, to select, of the detected intensity
of said second light, the intensity of said second
light emitted from said noted cell, as the intensity
of said second light.

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20. The intracellular-reaction measuring
apparatus according to claim 17, wherein;

said apparatus further comprises:

detection means for detecting the timing at which said chemical substances are introduced into said specimen; and

5 said selection means detects the intensity of said second light at least twice, before said chemical substances are introduced and after a certain time after said chemical substances have been introduced, to select, of the detected intensity of
10 said second light, the intensity of said second light emitted from said noted cell.

21. An intracellular-reaction measuring method for measuring intracellular reactions caused by
15 chemical substances, by the use of a specimen in which a plurality of cell colonies are contained in a non-contact state; the method comprising:

 a preparation step in which a specimen is prepared by incorporating into a cell a gene of a
20 protein serving as a target of the chemical substances and a gene of a fluorescent protein, culturing the cell, and thereafter incorporating a fluorescent probe for measuring intracellular reactions;

25 a specifying step in which the intensity of first fluorescence emitted from the fluorescent protein having been expressed together with the

target protein is detected to specify, of the plurality of cell colonies, a noted colony containing cells where the target protein is present; and

5 a selection step in which the intensity of second fluorescence emitted from the fluorescent probe is detected to select, of the detected intensity of the second fluorescence, the intensity of the second fluorescence emitted from the noted colony.

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22. An intracellular-reaction measuring method for measuring intracellular reactions caused by chemical substances, by the use of a specimen in which a plurality of cells stand adherent to one another; the method comprising:

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a preparation step in which a specimen is prepared by incorporating into a cell a gene of a protein serving as a target of the chemical substances and a gene of a fluorescent protein, culturing the cell, and thereafter incorporating a fluorescent probe for measuring intracellular reactions;

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a specifying step in which the intensity of first fluorescence emitted from the fluorescent protein having been expressed together with the target protein is detected to specify a target region having cells where the target protein is present, in

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a higher proportion than a stated standard proportion; and

5 a selection step in which the intensity of second fluorescence emitted from the fluorescent probe is detected to select, of the detected intensity of the second fluorescence, the intensity of the second fluorescence emitted from the noted region.

10 23. An intracellular-reaction measuring method for measuring intracellular reactions caused by chemical substances, by the use of a specimen in which a plurality of cells are contained; the method comprising:

15 a preparation step in which a specimen is prepared by incorporating into a cell a gene of a protein serving as a target of the chemical substances and a gene of a fluorescent protein, culturing the cell, and thereafter incorporating a
20 fluorescent probe for measuring intracellular reactions;

a specifying step in which the intensity of first fluorescence emitted from the fluorescent protein having been expressed together with the
25 target protein is detected to specify, of the plurality of cells, a noted cell where the target protein is present; and

a selection step in which the intensity of
second fluorescence emitted from the fluorescent
probe is detected to select, of the detected
intensity of the second fluorescence, the intensity
5 of the second fluorescence emitted from the noted
cell.